CASES OF FRACTURE OF SPINE AND LAMINECTOMY TREATED IN THE ROYAL INFIRMARY, NEWCASTLE-ON-TYNE.

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SENIOR SURGEON TO THE INFIRMARY.

CASE I.—J. B., aged eighteen years, "putter" in coal mine, admitted March 10, 1894.

On February 15 he was driving a pony drawing a tub of coal up a steep incline in the mine. When near the top the pony refused to pull any farther, and he went to the back to push; as he did so the chain became slack, the "cotterell" in consequence dropped out and released the tub, which then began to run back down the incline; unable to stop it he ran in front of it until, as it gained speed, it struck his back and threw him forward on his face. He lay unconscious for some minutes, and then got up and walked four or five yards, but was then compelled to lie down, owing to the severe pain in the back, but he was still able to move his legs. He was taken to the surface and then found he could not stand. He was carried home and put to bed. For twenty-four hours he could pass his urine, and then retention ensued. The anal sphincter was paralyzed from the first, and the small amount of power in his legs disappeared, with rapid wasting of muscles.

Condition on Admission.—He is a well-nourished, healthy, muscular lad. Temperature and pulse normal.

Spine.—At the lower part there is marked angular deformity, corresponding to the first, second, and third lumbar spines. Sphincter ani paralyzed, with complete incontinence of fæces, which are passed without being even felt. Bladder paralyzed; retention of urine.

Legs.—Muscles of thighs much atrophied; unable to flex thighs on abdomen, but can bring into action the sartorius and adductors. Muscles of legs wasted with marked pointing of toes.

Operation.—March 21, 1894. An incision eight inches long in the middle line, with its centre at the most prominent point of the deformity. Muscles separated on either side. The spine of the first lumbar vertebra was found fractured and detached. The spines of second and third were removed by bone forceps, and then the laminæ of the first three lumbar vertebræ were cut through with chisel and mallet and removed, exposing the theca vertebralis, which was covered with organized lymph; this was peeled off with dissecting forceps, freely exposing the membrane, through which the cord was seen pulsating. The wound was closed by deep and superficial sutures, and healed throughout by primary union.

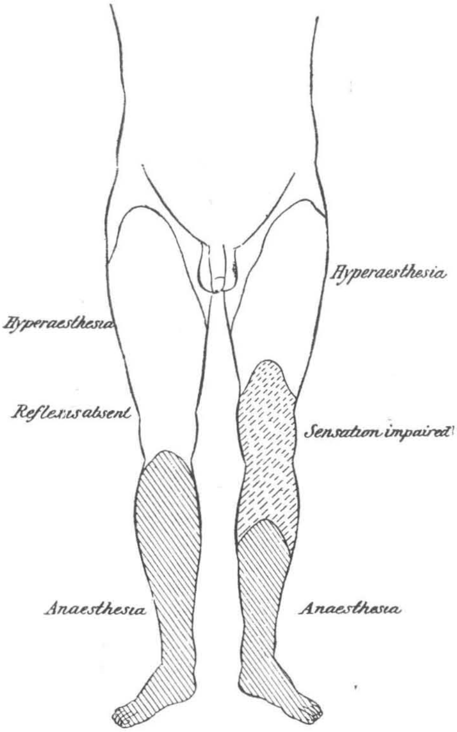

FIG. 1.—Showing area of disturbed or lost sensation in skin of Case I; all muscles paralyzed except sartorius and part of the adductors. Anterior view.

Progress after Operation.—Patient rallied well. Improvement began almost immediately, and continued steadily in both legs, the right leg always being a little ahead of the left. On April 19 there was marked increase in power in the right leg, which he could lift from the bed and bend the knee. The left leg improved, but to a less extent. Areas of anæsthesia rapidly decreasing. He can partially empty the bladder, and now feels a motion passing, but has no control. Reflexes still absent. On July 13 he walked out of the hospital. His gait at that time was shambling and rocking, not unlike that of a child with bad bow-legs; this might be partly caused by the drooping of the foot from paralysis of the flexors. He had to watch his steps like an ataxic, and almost fell in the endeavor to "right about turn" as he walked.

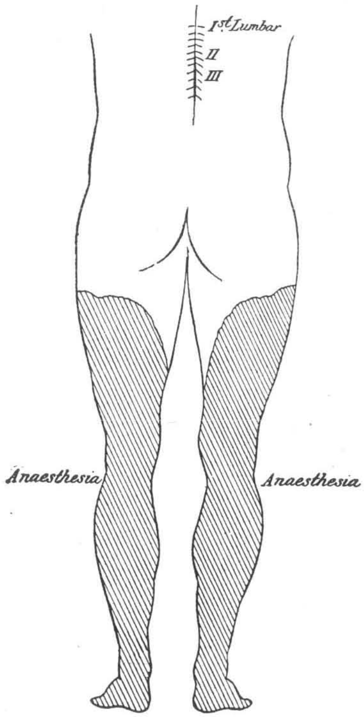

FIG. 2.—Case I. Posterior view.

The patient has shown himself from time to time, each time with decided improvement. On December 29 he walked from the station to the hospital, nearly a quarter of a mile, without help. He can sit down and rise with ease, and without help from his hands. His gait is nearly steady and erect, very little shambling. Can " right about turn" without fear, but with feet in contact and eyes closed he falls. Power in all the muscles except the flexors of the foot, still some atrophy of calf-muscles, but the thighs are approaching their normal bulk. Cutaneous sensation complete. He has full control over bladder and rectum. He feels no weakness in the back, and has given up wearing his poroplastic jacket, as he found he did not require it.

CASE II.—J. B., aged thirty years; coal-miner; admitted July 19, 1894. While working in the mine was crushed by a fall from the roof, causing complete paraplegia. He lay for two years before he came to the hospital. He was for some weeks in the medical wards under the care of Dr. Philipson, and, although the case had a most unpromising aspect, his own wish to undergo an operation was acceded to.

State on Admission to the Surgical Ward.—Is very pale and emaciated. Has bedsores and cystitis.

There is an angular deformity in the dorso-lumbar region of the spine.

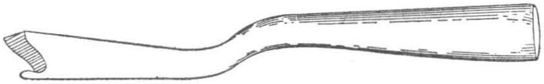

FIG. 3.—Special chisel for dividing laminæ.

Lower Limbs.—All the muscles are extremely atrophied, with complete paralysis of motion and sensation. All reflexes are absent. Retention of urine and incontinence of fæces.

Operation.—July 20, laminæ removed by a similar method to the preceding case, except that a special form of chisel was used (Fig. 3), which was found to facilitate the division of the laminæ after they had been partly cut through with a saw. When the third lumbar laminæ were removed the dura was found covered with fibrin; the cord did not pulsate. The laminæ above were then cut through and removed, the dura being so firmly adherent that it was torn in two places. The cord here appeared as a flattened band, and, on introducing the finger into the canal, a sharp projection of bone from the posterior aspect of the body of the first lumbar vertebra could be felt crushing the cord, which did not pulsate.

Wound closed by deep and superficial sutures. Healing throughout by primary union.

After Progress.—Some collapse, but rallied well. The cystitis disappeared, but no other improvement took place.

CASE III.—H. R., aged thirty-three years; coal-miner; admitted July 17, 1894. Seven weeks ago, when at work in a stooping position, was crushed by a fall from the roof, supposed to weigh five or six tons. When dragged out he found he could not use his legs and had no feeling below the knees.

State on Admission.—Spine: first three lumbar spines prominent, with marked rigidity.

Legs.—Power in adductors fair. Flexion of right leg more complete than the left, and appears to be effected by adductors and sartorius, complete *paralysis of hamstring muscles.* Retention of urine and incontinence of fæces, but he sometimes knows when bowels are acting.

Operation on July 24 by the same method as Case II. The spines of three upper lumbar vertebræ were found fractured. The laminæ of two upper were removed, exposing the dura mater which was covered with fibrinous exudation, the cord appeared flattened and did not pulsate. The wound was closed as in the other cases, and healed by primary union.

After Progress.—Patient was much collapsed after the operation, but soon recovered. Some slight increase in muscular power was observed, but sensation was not improved.

Faradism and massage were employed without result, and when last heard of he was no better than before the operation.

CASE IV.—J. P., aged twenty-five years; laborer; admitted July 16, 1894. While at work at the face of a tall heap of artificial manure it fell on him, threw him backward and buried him. When he was dragged out, five minutes afterwards, he had acute pain in the small of his back, and had lost all power in his legs. He was at once brought to hospital.

State on Admission.—Spine: marked prominence of fifth, sixth, seventh, and eighth dorsal spines.

Legs.—Power in adductors and flexors of thigh good. Hamstrings and muscles of leg paralyzed, left weaker than right, with retention of urine and incontinence of fæces. Patient refused operation, but some improvement took place. He could lift the legs from the bed and bend the knees, but no further improvement followed, and he went to his home in the country. He returned after a few months in the same condition, but the toes were becoming clawed and stiff. He still refused operation.

A review of these and other cases reported in the ANNALS OF SURGERY and elsewhere suggests some points for consideration.

(1) Where the case has not been submitted to immediate operation time seems to be an important element, the chance of recovery being lessened by delay.

(2) Pulsation in the cord. In none of the cases reported in the ANNALS, in June, August, and October, 1894, is that alluded to. Of my three cases of laminectomy the first was the only one in which that was seen,—it was carefully looked for in all,—and that was the only one attended with a really satisfactory result. If I were doing the operation again, and failed to get pulsation in the cord, I should certainly attack at least one arch above, and either remove it, or, after dividing one lamina, prize it up, so as to be sure there was no pressure.

(3) In none of the cases was the theca deliberately opened, as there did not appear to be any necessity for it or advantage to be gained. In Case II it was unavoidably torn and fluid escaped, but the wound healed as readily as in the other cases.

(4) The operation itself is not more dangerous than many others that are undertaken without hesitation. In all my cases there was some collapse, but they soon rallied, and all the wounds healed readily without suppuration.

For the notes of the cases I am indebted to the surgical registrar, Mr. A. M. Martin, and to my house-surgeon, Mr. W. E. Harker, to the latter of whom, as also to his predecessor, Mr. J. Braithwaite, I am indebted for that careful attention which greatly contributed to their rapid recovery from the operations.